



**(WO/2005/070614) PROCESS FOR FORMING ULTRAFINE CRYSTAL LAYER,
MACHINE COMPONENT HAVING ULTRAFINE CRYSTAL LAYER FORMED BY THE
ULTRAFINE CRYSTAL LAYER FORMING PROCESS, PROCESS FOR PRODUCING
THE MACHINE COMPONENT, PROCESS FOR FORMING NANO-CRYSTAL LAYER,
MACHINE COMPONENT HAVING NANO-CRYSTAL LAYER FORMED BY NANO-
CRYSTAL LAYER FORMING PROCESS, A**

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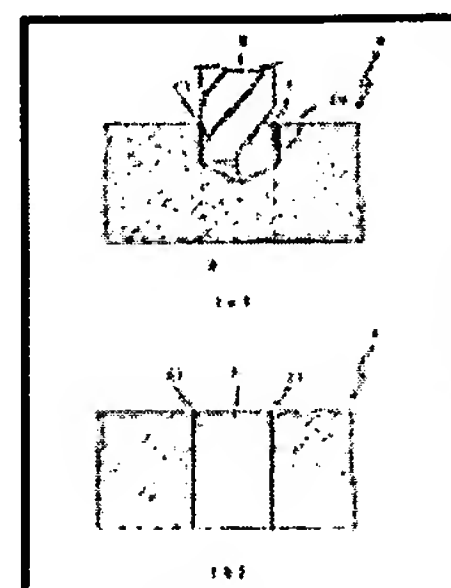
Title: (EN) PROCESS FOR FORMING ULTRAFINE CRYSTAL LAYER, MACHINE COMPONENT HAVING

ULTRAFINE CRYSTAL LAYER FORMED BY THE ULTRAFINE CRYSTAL LAYER FORMING PROCESS, PROCESS FOR PRODUCING THE MACHINE COMPONENT, PROCESS FOR FORMING NANO-CRYSTAL LAYER, MACHINE COMPONENT HAVING NANO-CRYSTAL LAYER FORMED BY NANO-CRYSTAL LAYER FORMING PROCESS, A

(JA) 超微細結晶層生成方法、その超微細結晶層生成方法により生成された超微細結晶層を備えた機械部品、及び、その機械部品を製造する機械部品製造方法、並びに、ナノ結晶層生成方法、そのナノ結晶層生成方法により生成されたナノ結晶層を備えた機械部品、及び、その機械部品を製造する機械部品製造方法

Abstract:

(EN) A process for stably forming an ultrafine crystal layer on the surface of a metal product at a low cost. A hole part (1) is bored in a workpiece (W) by means of a drill (D) and a large strain is imparted to the inner circumferential surface of the hole part (1), thus forming an ultrafine crystal layer (C1). The inner circumferential surface of the hole part (1) is subjected to plastic forming with a true strain of at least 1, and the material temperature at the formed surface of the hole part (1) is maintained in a temperature range from the Ac1 transformation point to below the melting point. Alternatively, it is maintained at a temperature not exceeding the Ac1 transformation point. In such a way, an ultrafine crystal layer (C1) can be stably formed on the inner surface of the hole part (1) at a low cost.



(JA) 金属製品の表面に超微細結晶層等を低コストで、かつ、安定して生成することができる超微細結晶層生成方法等を提供する。被加工物Wに対して、ドリルDによる孔部1の穴あけ加工を行うことにより、その孔部1の内周面に大歪を与えて超微細結晶層C1を生成する。この場合には、孔部1の内周面に少なくとも真歪1以上の塑性加工を与え、かつ、孔部1の加工面の材料温度をAc1変態点以上かつ融点未満の温度範囲に維持する。又は、Ac1変態点を越えない温度に維持する。これにより、孔部1の内周面に超微細結晶層C1を低コストで、かつ、安定して生成することができる。

Designated States:

AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.
African Regional Intellectual Property Org. (ARIPO) (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW)
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